

# PATENT COOPERATION TREATY

Gryn 220

From: THE INTERNATIONAL PRELIMINARY  
EXAMINING AUTHORITY

**Rec'd PCT/PTO**

13 MAY 2005

To:

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FRANCE

## PCT

### WRITTEN OPINION

(PCT Rule 66)

<p>Mailing date (day/month/year)      14/10/2004</p>		
<p>Applicant's or agent's file reference B 10957 PCT</p>	<p><b>DEADLINE FOR RESPONSE</b> 1/00 months/days from the mailing date indicated above</p>	
<p>International application No. PCT/FR 03/50109</p>	<p>International filing date (day/month/year) 29/10/2003</p>	<p>Priority date (day/month/year) 13/11/2002</p>
<p>International Patent Classification (IPC) or both national classification and IPC  C01B21/04</p>		
<p>Applicant  N GHY</p>		

1. The present written opinion is the first opinion of this nature prepared by the International Preliminary Examination Authority.
2. The present opinion contains indications and the corresponding pages relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-formulation of an opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of the invention
  - V ☒ Reasoned statement under Rule 66.2.a)ii) with regard to novelty, inventive step and industrial applicability; citations and explanations in support of this statement
  - VI ☐ Certain documents cited
  - VII ☐ Irregularities in the international application
  - VIII ☐ Observations on the international application
3. The applicant is **invited to respond** to the present opinion.
 

**When?** See the deadline indicated above. The applicant may, prior to the expiration of this deadline, request the International Preliminary Examining Authority for an extension; see Rule 66.2.d).

**How?** By submitting a response in writing accompanied, where appropriate, by amendments in accordance with Rule 66.3. For the form and language of the amendments, see Rules 66.8 and 66.9.

**Also** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments or arguments, see Rule 66.Abis.  
For unofficial communication with the examiner, see Rule 66.6.

**If there is no response**, the International Preliminary Examination Report will be prepared on the basis of the present opinion.
4. The deadline for issuance of the International Preliminary Examination Report according to rule 69.2 is: 13/03/2005.

<p>Name and mailing address of the International Preliminary Examination Authority</p> <p>European Patent Office – P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk – Netherlands Tel: (+31-70) 340-2040 Fax: (+31-70) 340-3016</p>	<p>Authorized officer</p> <p>Examiner</p> <p>Procedures officer (including extension of deadlines) Tel. (+49-89) 2399 2828</p>
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**I. Basis of the opinion**

1. The present written opinion is based on the documents of the application as originally filed.

**V. Reasoned statement under Rule 66.2.a (ii) with regard to novelty, inventive step and industrial applicability**

1. In light of the documents cited in the International Search Report, it is considered that the invention as claimed in at least one of the claims does not seem to meet the criteria set forth in PCT Article 33.1., i.e., it does not seem to be novel or to involve an inventive step (see the International Search Report, particularly the X and/or Y documents cited and the corresponding claim numbers).
2. If amendments are submitted, the applicant must meet the requirements of PCT Rule 66.8 and indicate what, in the application as originally filed, might serve as a basis for the amendments made (PCT Article 34.2.b); otherwise, these amendments may not be taken into consideration in the preparation of the International Preliminary Examination Report. The applicant's attention is drawn to the fact that in the event of an unnecessarily large number of independent claims, no examination will be performed for any of the claims.

NB: If the applicant decides to request a detailed substantive examination, then ordinarily an International Preliminary Examination Report will be issued directly. In certain cases, the examiner may issue a second written opinion, if expressly requested.

**CABINET GRYNWALD**

INTELLECTUAL PROPERTY COUNSEL

PATENTS, TRADEMARKS, DESIGNS, COPYRIGHTS, CONTRACTS, LITIGATION, NEGOTIATIONS, TECHNOLOGY MONITORING

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**Re: International Patent Application No. PCT/FR03/50109, filed on October 29, 2003 in the name of N. GHY.**

**Our Ref.: B10957 PCT (CT – GC)**

Paris, November 26, 2004

Gentlemen:

In response to the Written Opinion and the International Search Report issued on September 16, 2004 with regard to the above-referenced international application, please find attached a memo of observations.

With our sincere regards,

Albert GRYNWALD

[SIGNED]

Encl.: As indicated

cc: A.R.

**International Patent Application No. PCT/FR03/50109**  
**filed on October 29, 2003 and having the title**  
**“ENRICHMENT OF OXYGEN FOR THE PRODUCTION OF**  
**HYDROGEN FROM HYDROCARBONS WITH CO<sub>2</sub> CAPTURE”**

**RESPONSE TO THE WRITTEN OPINION OF OCTOBER 14, 2004**

**I. THE PRIOR ART CITED**

The Search Report mentions six documents in Category X:

**Document D1:** WO 01 25141 A (BALLARD POWER SYSTEMS;  
SEDERQUIST, RICHARD (US)), April 12, 2001 (2001-04-12)

The passages cited below are opposed in Category X to claims 1, 2, 4-8,  
11, 12, 14-19:

\* page 11, line 29 through page 19, line 30 \*

\* figure\*

**Document D2:** WO 02 47464 A (TEXACO DEVELOPMENT CORP),  
June 20, 2002 (2002-06-20)

The passage cited below is opposed in Category X to claims 1, 2, 8, 11,  
12, 19:

\* page 4, paragraph 5 through page 7 \*

**Document D3:** US 2001 045061 A1 (PLEDGER, WILLIAM A. ET AL),  
November 29, 2001 (2001-11-29)

The passage cited below is opposed in Category X to claims 1 and 11:

\* paragraph 0045 to paragraph 0051 \*

\* Fig. 6 \*

**Document D4:** US 2002 034458 A1 (ROY, SURAJIT ET AL), March 21, 2002  
(2002-03-21)

The passage cited below is opposed in Category X to claims 1, 4, 8, 11,  
14, 19:

\* paragraph 0039 to paragraph 0044 \*

\* Fig. 1 \*

**Document D5:** WO 02 085781 A (WUENNING, JOACHIM A.), October  
31, 2002 (2002-10-31)

The passage cited below is opposed in Category X to claims 1 and 11:

\* claims \*

\* figure \*

**Document D6:** EP 0 936 183 A (TOPSOE HALDOR AS), August 18,  
1999 (1999-08-18)

The passage cited below is opposed in Category X to claims 1 and 11:

\* paragraph 0013 \*

The Search Report mentions three documents in Category A:

**Document D7:** EP 1 035 072 A (TOPSOE HALDOR AS), September 13,  
2000 (2000-09-13)

The passage cited below is opposed in Category A to claims 10 and 21:

\* claims \*

**Document D8:** US 1 960 886 A (WOODHOUSE, JOHN C.), May 29,  
1934 (1934-05-29)

The passage cited below is opposed in Category A to claims 1 and 11:

\* figure \*

**Document D9:** US 6 264 820 B1 (BRACE, CHRISTOPHER WILLIAM ET AL), July 24, 2001 (2001-07-24)

The passage cited below is opposed in Category A to claims 9 and 20:

\* column 2, line 59 through column 3, line 45 \*

## **II. STRUCTURE OF THE CLAIMS**

The application filed comprises 21 claims divided into 10 method claims and 11 device claims. Device claims 11 through 16 correspond mutatis mutandis to method claims 1 through 6. Device claims 18 through 21 correspond mutatis mutandis to method claims 7 through 10.

### III. DISCUSSION

#### III. 1. General observations on the multiplicity of documents cited.

The table below illustrates the claims whose scope would be affected according to the examiner. The use of such a table is necessary in order to try to clarify a situation that is extraordinarily confused by the number of documents cited in opposition to the same claims.

	Method										Device										
Claim	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
D1	*	*		*	*	*	*	*			*	*		*	*	*	*	*	*		
D2	*	*						*			*	*							*		
D3	*										*										
D4	*			*				*			*			*					*		
D5	*										*										
D5	*										*										

It is clear from this table that, rightly, the examiner does not cite any document in opposition to method claims 3, 9, 10 or the respective device claims 13, 20, 21.

#### III. 2. Analysis of claim 1 with respect to the documents cited

Method claim 1 (and the respective device claim 11) comprise, among other things, the following four distinctive characteristics:

- (a) a step for using a flow of (pure or nearly pure) oxygen to oxidize a portion of the hydrocarbons and to supply the heat required to convert, using water vapor, at suitable temperatures, nearly all of the other portion of the hydrocarbons into hydrogen, carbon monoxide and carbon dioxide, so that the hydrogen production yield is thus improved

...

- (c) steps for cooling the conversion products in order to recover a fraction of the thermal energy of said conversion products for the purpose of preheating said reagents and condensing (13) at least part of the water vapor contained in said conversion products

...

- (d) steps for recovering the hydrogen...

by extracting the hydrogen from the conversion products, either in order to consume it, or to store it for later consumption

...

said steps being performed at suitably high pressures, particularly above 30 bar, in order to:

- intensify the heat exchanges, and/or
- increase the compactness of the method, and/or
- promote the liquefaction of the carbon dioxide (14) by cooling, and/or
- promote the condensation (13) of the water vapor by cooling, and/or
- improve the overall efficiency.

None of the documents cited teaches or suggests the combination of these four distinctive characteristics, as the following table illustrates:

	Pure oxygen	Condensation of the water vapor	Extraction of the hydrogen	Pressure > 30 bar
D1		No	No	No
D2	No	No	No	No
D3	No	No		No
D4		No		No
D5		No	No	No
D6			No	

It is therefore incorrect for the examiner to maintain that the patentability of claim 1 is affected by the documents cited.

It goes without saying that the corresponding claim 11 and the dependent claims are consequently also patentable.

### III. CONCLUSION

Since the set of claims meets the criteria for patentability, the applicant requests that the International Preliminary Examination Report declare the novelty and the inventive step of the claims filed.